



Attorney Docket No.: 10541-281

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 2875

Examiner: Guiyoung Lee

Inventors: McMillan, et al.

Serial No.: 09/966,495

Filing Date: 28 September 2001

Title: ETCHE METAL LIGHT REFLECTOR  
FOR VEHICLE FEATURE  
ILLUMINATION

MS Non-Fee Amendments  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Richard K. McMillan hereby declares that:

1. I am an inventor of the invention as claimed and described in the above-identified application.

2. I conceived said invention in the United States prior to October 22, 1999, as evidenced by the date September 1, 1999 in the "Records of Invention" section of the Invention Disclosure form, the technical notebook page number 21, and the meeting summary. The Invention Disclosure form being attached hereto as Exhibit A, the technical notebook page being attached hereto as Exhibit B, and the meeting summary being attached hereto as Exhibit C.

3. Said invention was diligently worked on from a date prior to October 22, 1999 until the date of constructive reduction to practice (the filing date of the present application) as further evidenced by the drawings attached hereto as Exhibit D.

**DECLARATION OF  
RICHARD K. MCMILLAN  
UNDER 37 C.F.R. §1.131**

4. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statement may jeopardize the validity of the above-identified application, and any patent issuing thereon or any patent to which this declaration is direction.

Dated: 2 Feb 2004

  
Richard K. McMillan



OLID HOME

FGTI MAIN PAGE

## EXHIBIT A

Current owner company. [Change?](#)

Visteon

| DIRECTORY | FGTI | HUB

Related Links: [View Invention Disclosure](#) | [Assign/Evaluate Disclosure](#) | [View Invention Ranking](#)

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## Online Invention Disclosure: View Invention Disclosure

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**Inv. Discl. Docket No:** V200-0300  
**Creation Date:** 4/14/00  
**Approval to submit was given by:** CRUTYNA: 12-APR-00 RMCMILL1:  
WSTEPANE: 12-APR-00

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### Section 1: INVENTION DESCRIPTION

**Title of Invention:** ETCHEDE TRI-METAL AS A LIGHT REFLECTOR  
**Patent Evaluation Committee:** VNTO  
**CPSC Code:** 17.00.00  
**Originating Country Code:** US  
**Related Disclosure(s):** None

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### Section 2: PROBLEM & SOLUTION

**Description or Comments:** Some of the new production automotive designs for running and turn indication lighting for an automobile are substituting LED's in place of the traditional filament bulbs. The lamp assemblies with LED's in production today use a stamped metal bussbar/fetts to electrical conduct and mounting retention supports for the LED's. The problem is that Metal fetts aren't the most cost effective or flexible material to mold or shape to the varying contours and bends of a vehicle lamp assembly. In addition, because the fett's are electrically conductive, a gap or non-conductive separation must be kept between the two fett's buses or shorts will result during the manufacturing of the assembly. The solution is to use ETM or flex circuit with a reflective side, instead of fetts. They are far more flexible and accommodating to shape to the varying contours of a lamp assembly. Also, the Aluminum of the ETM can be used as a reflective layer which will reflect more of the scattered and lost back

lighting forward and more evenly. The ETM also has heat-sinking characteristics.

**Attachment:** See Section:9 ATTACHMENTS

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**Section 3: PRIOR ART**

**Description or Comments:** See Hewett Packard snapLED 70 LEDs technical data sheet.

**Attachment:** See Section:9 ATTACHMENTS

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**Section 4: NEW TECHNOLOGY**

**Description or Comments:**

**Attachment:** See Section:9 ATTACHMENTS

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**Section 5: DETAILED DESCRIPTION**

**Description or Comments:** In the attachment section are two basic overview diagrams on how this invention could be applied. The attachment integrated LED and Drive, Illustrates how the various individual silicon die chips could be arranged in various patterns and electrically bonded to ETM or reflective flexible circuit. Then this device could be mechanically and electrically bonded onto a printed flex circuit as a microchip. The attachment name ETM invention with LED, Illustrates how the various individual microchips could be electrically bonded to the ETM or reflective flexible circuit. This invention will eliminate the need to stamp out conductive metal feets currently manufactured. Review disclosure #13906 to see how this invention was applied in a vehicle lamp assembly.

**Attachment:** See Section:9 ATTACHMENTS

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**Section 6: DATES**

**Record(s) of Completion:** September 1st week, 1999. Meeting minutes taken by Rick McMillan

**Date of Completion:** 12/20/00

**First Production Use:** vehicle: 2004  
**[Model and Date]**

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**Section 7: CATEGORY QUESTIONS**

**Invention Category:** Manufacturing

Category Questions do not exist or not answered.

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**Section 8: MISCELLANEOUS ITEMS**

**Is it a Government Contract?:** No  
**If yes, Government Contract Number:**  
**Identify a government agreement, partnership, consortium, or other company involved with conception or first building of the invention:** none  
**If disclosed to non-Company personnel, identify recipient and date:** none

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**Section 9: ATTACHMENTS**

<b>File Name</b>	<b>Description</b>
Click on File Name to view and print it. <b>Files submitted before Feb. '00 may be found in OLD &amp; others in NEW</b>	
13926IntegratedLEDandDrive.doc: <a href="#">OLD</a>   <a href="#">NEW</a>	Illus. of ETM, LED and Driver integrated into one IC.
13926ETMinventionwithLED.doc: <a href="#">OLD</a>   <a href="#">NEW</a>	Illus. of the invention

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**Section 10: INVENTORSHIP**

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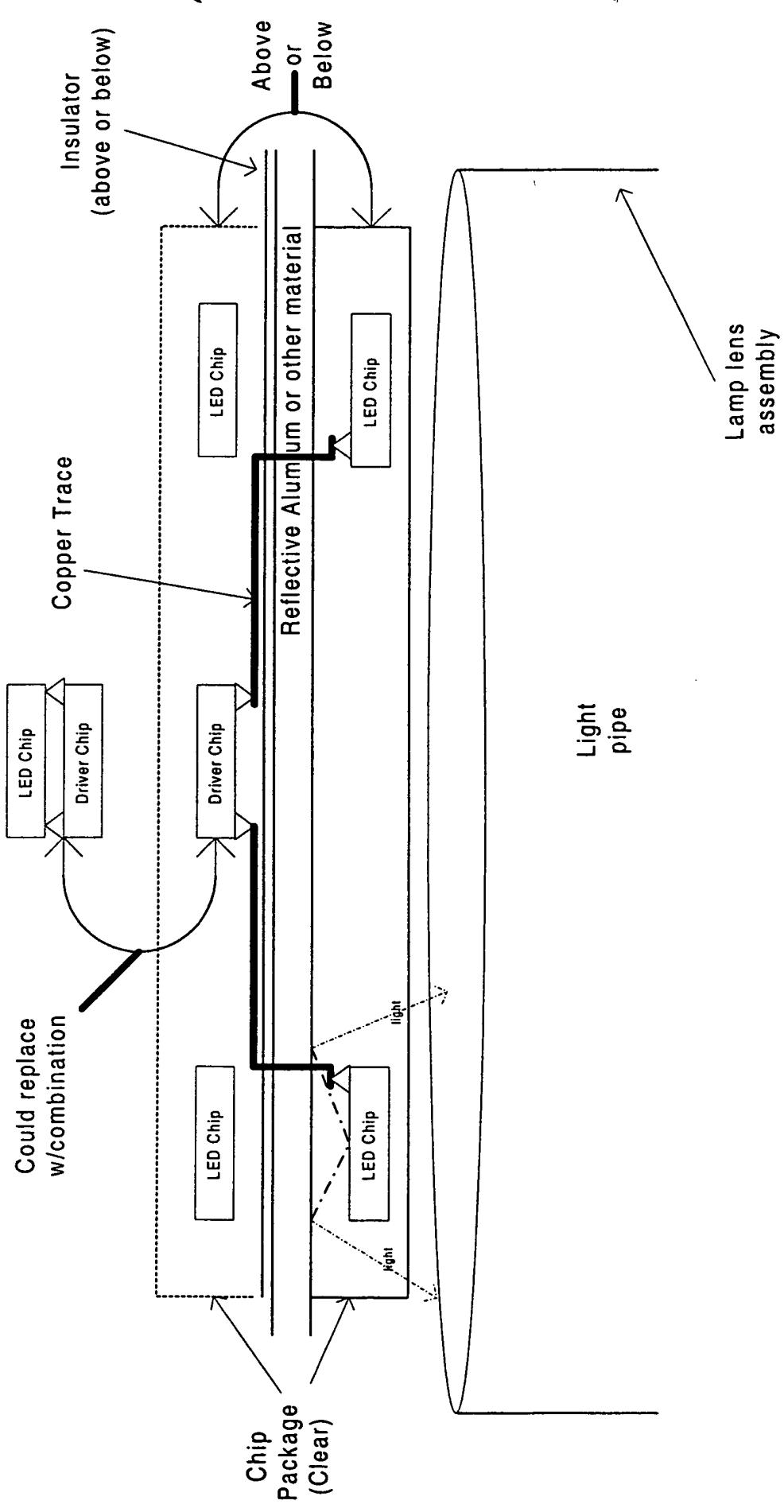
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**Department:** A237  
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**Manager's CDS Id:** jbaker6

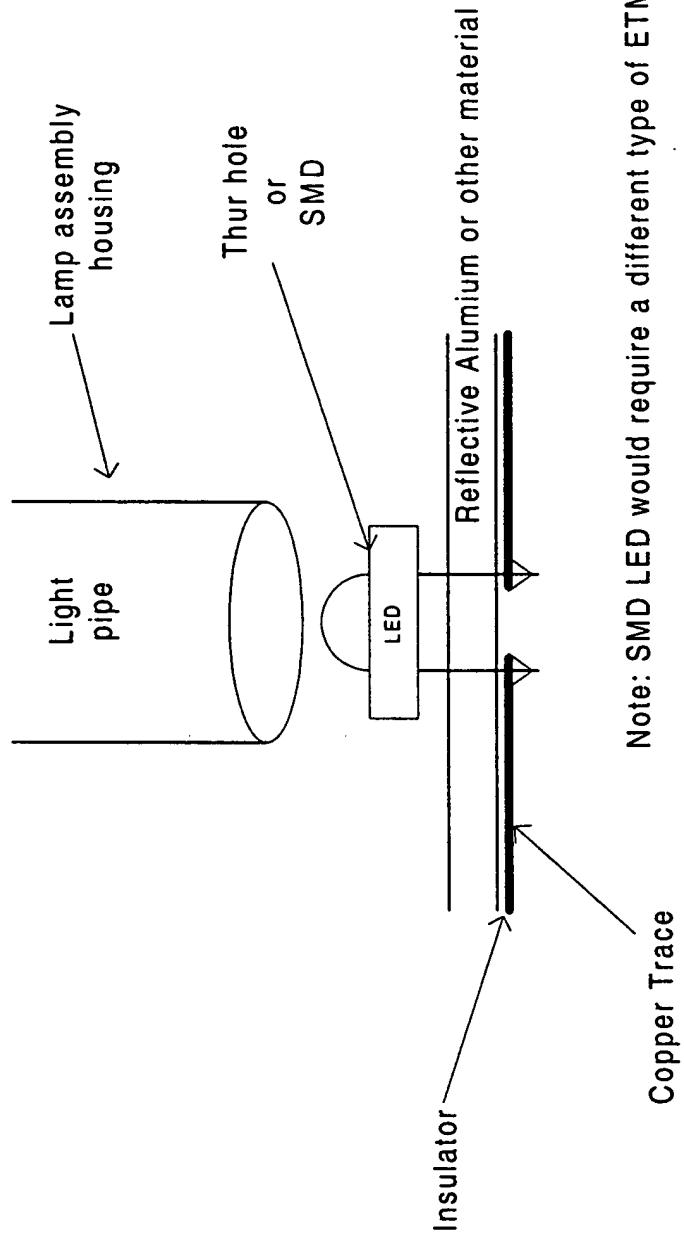
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<b>Manager's CDS Id:</b>	tvanderl

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Owner: DPORCARL | Version 1.1 | Last Updated: March 07, 2000

## Invention #6





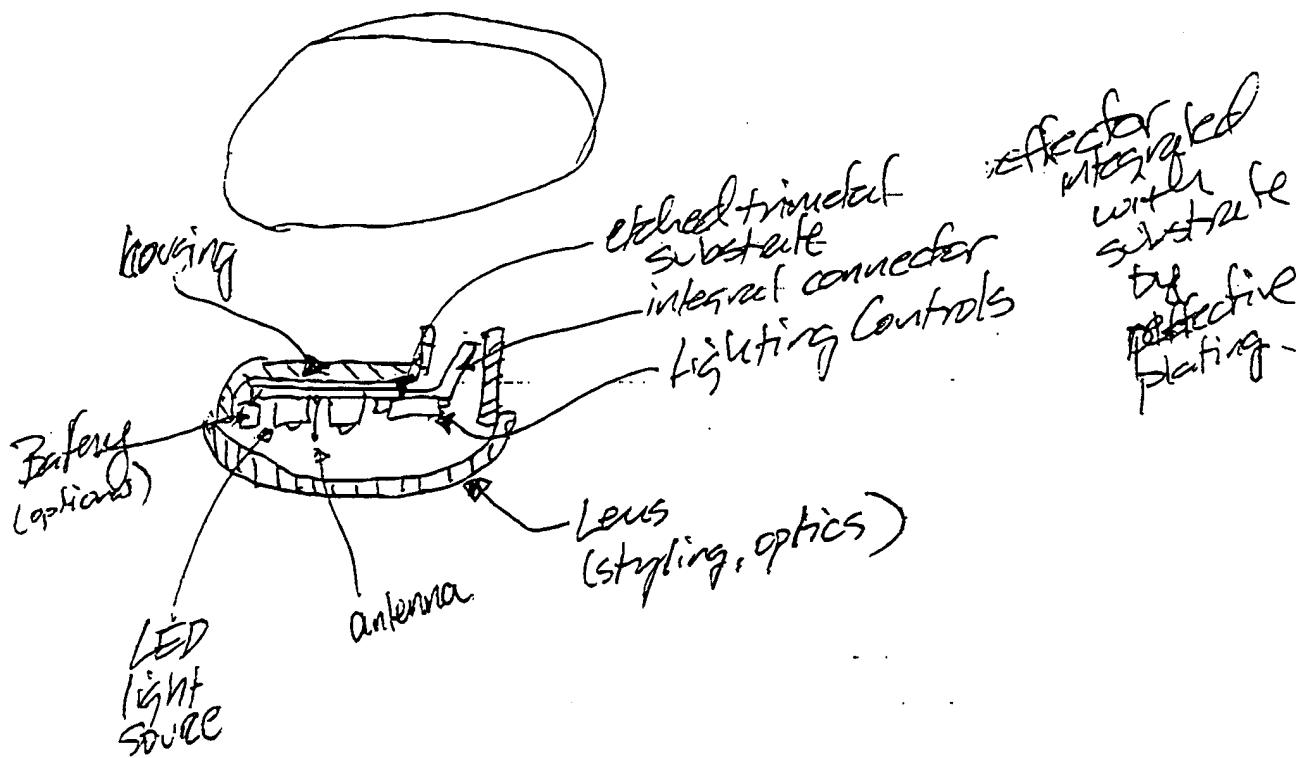
Note: SMD LED would require a different type of ETM design.

Date and sign every entry. Have every possibly important entry witnessed.  
Submit an Invention Disclosure of anything possibly new and inventive.

PAGE

21

## Multifunction Automotive Lamp



### Lamp Assembly

- ③ • removable
  - ② • battery powered
  - ① • 9/14/42 V Power supply
  - enables functions
    - removable light emergency, flashlight,
    - parking lights that do not drain vehicle battery (useful in emergency situations)
    - Dual Intensity Lighting (Brakes)
  - ① • LED light source
  - ① • logic controls
- lighting patterns & dynamic control
- Patrick McMillan  
9/17/13

The above understood  
and witnessed by \_\_\_\_\_

Date and  
by \_\_\_\_\_

Date \_\_\_\_\_

## EXHIBIT C

The invention consists of a multi-functional automotive lamp assembly and method of making same. The invention can replace typical automotive lamp assemblies of the kind used at the four corners of the vehicle (e.g., headlamps & taillamps), but with provisions for additional functions. Key to the invention is a novel design and manufacturing approach which enable electronic circuits to be included integrally as part of the lamp assembly at low cost and with high reliability. This improved lamp assembly enables beneficial features which are new or improved vs. those available using prior art design and manufacturing.

### Features provided:

- LED Lighting with On-board Electronic Controls
- Electronically controlled lighting intensity, on-off timing and sequence
- Integration of additional electronic content:
  - Antennas & receiver module for radio, phone, GPS, etc.
  - Sensors: video camera, radar, laser, ultrasound, etc
  - Communication transmitter to external devices: RF or IR or audible
  - Vehicle communication network node (eg, SCP, CAN, etc)
  - Integration site for electronic logic / controls of off-board functions
- On-board power supply allows multiple supply voltages (14V / 42V / 9V / other)
- On-Board Battery
  - On-board battery re-charging system (recharged while driving)
  - Light is removable from vehicle for use as emergency light, flashlight, etc.
- Lighting reflector integrated with electronic substrate
- Connector is integral with electronic substrate and light housing

LED light source(s). LEDs offer low power consumption, low heat generation, improved reliability, availability in various colors, and compatibility with electronic controls. Electronically controlled lighting provides the ability to offer variable intensity and timing/sequencing of individual or multiple LEDs. This allows lighting function and features to be customized for various customers and additional features to be provided not easily or cost effectively provided using remote electronics. On-board electronics also simplifies vehicle wiring, reducing wire harness cost, weight, and complexity.

On board multi-source power supply. <Wait to provide details of embodiment>. A multi-source power supply enables the multi-function lamp to be used in vehicles with 14V, 42 V, mixed voltage or other vehicle electrical architectures and provides improved output power supply consistency and improved lighting reliability vs conventionally switched & fused incandescent lamp technology.

The multi-source power supply allows cost-effective implementation of alternative on-board power sources (such as a nine volt battery). This allows the lamps and other on-board electronic features to operate without draining the vehicle battery. This would be useful in extended emergency parking situations, to provide lighting for extended periods (extendable by changing the on-board battery) such as when camping, and for allowing other on-board electronics (for example sensors, receivers, transmitters, etc) to operate when the vehicle is off without draining the vehicle battery. The on-board power source also allows the lamp to function independent of the vehicle, for example as a portable emergency light, flashlight, lantern, etc. An on-board battery re-charging system allows the battery to be recharged while driving and to monitor charge level so owner can be signaled when the battery needs to be replaced.

Antennas and receivers integrated with the lamp provide improved reception due to unobscured viewpoint and relative freedom from electromagnetic barriers such as the vehicle sheet metal frame. On-board reception/processing of received signals allows digital transmission of the received signal throughout the rest of the vehicle, improving signal quality and reducing wiring cost & weight.

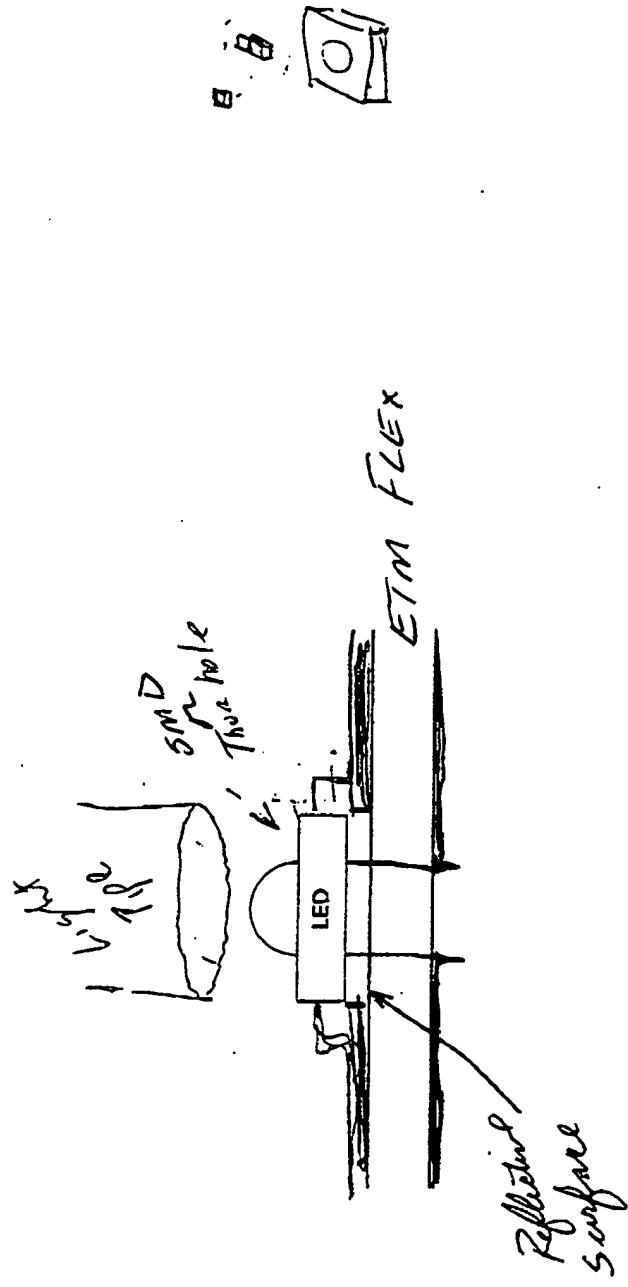
On-board sensing capability enables various desirable features: video sensing for obstacle detection, video rearview mirrors, video monitoring of vehicle surroundings (safety, anti-theft) and others (see invention disclosure relating to video enabled features Jay Baker, et al). Laser, ultrasound, infrared (IR) and other electronic sensors enable Intelligent Vehicle Highway Systems (IVHS), Adaptive cruise control, pre-crash sensing, obstacle detection, security functions, etc. Security features such as motion detector actuated lighting could be implemented cost effectively (lights go on when someone walks by).

On-board transmitters allow communication with external devices such as: other vehicles (e.g., to enable IVHS), point of sale devices (e.g. gas pumps for automated purchases), actuation of remote functions from within the vehicle (open garage, turn on house lights), the ability to offer current and future automated convenience features without additional hardware (eg, automated toll collection—Speedpass or other automated capability could be enabled by configuring the feature in software—every vehicle would be "Speedpass Ready"—no separate Speedpass unit would be required).

Summary from LED Lighting Brainstorm meeting  
9/1/99 (see attendee list attached). File creation  
date 9/16/99 (file: mf.light.doc)



## Invention #3



Confidential

ADDS

1. lower cost
2. FLEX
3. Vent sink



Current Design

1. BULB
2. Conn socket
3. Plastic /Pefectne Honey

WATER ENTRY ISSUES